

SOME POINTS CONNECTED WITH
THE PATHOLOGY, HISTOLOGY,
ETIOLOGY AND DIAGNOSIS OF
MYO-FIBROMATA OF THE UTE-
RUS.

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Homeomorphous, homologous or histoid tumors as distinguished from those morbid states developed without neoplasm, consist essentially in the production of new elements formed out of the elements of the uterine tissues or their analogues (mesoplastic elements). A tumor resembling its matrix tissue in texture, Virchow calls *homæoplastic*—one which differs widely—*heteroplastic*. A heteroplastic tumor, in regard to site, is *heterotopic*, and *heterochronic* in regard to time. Strictly speaking, all tumors are heteroplastic. To distinguish it from hyperplasia, a homologous growth must be heteroplastic, while a true heterologous growth must be heteroplastic. Excessive induration rather than histological character gives rise to the name fibrous. Under the name fibro-myoma, Virchow classified all the uterine growths which are composed of unstriated muscular and connective tissue. It is often difficult to distinguish hard fibrous tumors from some forms of sarcoma, while the sub-mucous variety of soft fibrous tumors is closely related to myxomata on the one hand, and to adenomata on the other. Myoma is a tumor consisting essentially of new-formed muscular fibres, the name *Leio-myoma* being given to those in which the fibres are non-striated. A *fibro-myoma* is one in which the fibrous tissue forms a considerable part of the bulk. The fibroma is developed from proliferous connective tissue cells. The transformation of the proliferated cellular tissue into fibrous tissue is effected by the same steps as in fibrous hyperplasia (Fiegler, Path. Anat.). Leio-myomata are invariably innocent, though they may cause danger by their tendency to bleed. Fibromata are limited hypertrophies of the substance of the uterus, globular in form, and are only held in a capsule of fibro-cellular tissue. Structurally they are homologous with the tissue of the uterus itself. In the last edition of

Cornil and Ranvier, there appears the following description of the *Leio-myoma* of Zenker: "These tumors may present themselves under the form of an irregular, diffused mass, with ill-defined borders, or may show a very distinct lobular form. They have a fleshy or fibrous aspect. The muscle-cells offer the same characters as in the physiological state, and may be grouped into fasciculi or membranes, or may be isolated in the midst of connective tissue. The fasciculi are separated by connective tissue in which run the *blood-vessels*; the latter *nerves* penetrate the muscular fasciculi themselves. When the muscular elements are isolated, they are recognized by their spindle form, and their rod-shaped nucleus in the centre of the cell. Leio-myomata may be formed of fasciculi which may all run in the same direction, or which may interlace. The section may take them transversely, obliquely or longitudinally. In cross-sections the cells appear with a more or less circular outline, with the nucleus appearing as a little round spot in the centre. * * A very interesting property of myomata is their contractility. Upon this property greatly depends the varying consistency which they possess at the moment when they are examined. This phenomenon is particularly noticeable in the myomata which are commonly called fibroid bodies of the uterus."

In the Transactions of the American Medical Association for 1882, there is a most unique and admirable paper by Dr. H. O. Marcy, of Boston, upon "Fibroid Tumors of the Uterus." It is profusely illustrated with microphotographs reproduced by the heliotype process, which show the arrangement of muscular and connective fibres very nicely, and which, in one instance, point to the vascularization of these growths. As Dr. Marcy's observations are the results of his own microscopical and clinical work, and of permanent value as proven facts, rather than probable theories, I shall make liberal quotation from his paper. "This class of growths increases much the more rapidly, and during their active stage of development the capsule is less distinct. Few vessels enter the tumor direct, and its growth would appear to depend upon the nourishment which goes on in large measure by absorption from the surrounding vessels. These tumors are often of a very considerable

size, without being able to trace into their substance a single vessel. Turner described the injection by Goodsir of a pediculated sub-peritoneal myoma. Vessels of considerable size branched off from the pedicle, and were distributed to the peritoneal surface of the tumor. In the loose connective tissue, between the lobulated portions, vessels were also to be seen, although the lobules themselves were colorless. The tumor, as a whole, was strikingly less rich in vessels than the uterus. Microscopic examination of uterine fibroids shows the muscular fibres arranged in bundles, which differ in size not only in their constituent elements, but in their numbers, and unite variously at acute angles to constitute larger groups, and thus form open spaces; these, according to Klebs, enclose a wide capillary blood-vessel, the walls of which consist of a simple layer of endothelium cells with large nuclei, and are supported by a thin layer of fibrous connective tissue."

It is with the greatest difficulty that the capillary vessels can be isolated or even distinguished from the enveloping connective tissue, and Klebs declares still farther, that which lacks proof, and is offered as a theory to explain the fibro-cystic formation which very rarely supervenes, that "the narrow slit-like gaps, observed in the careful examination of the connective tissue stroma, are to be regarded as lymph spaces, from which a cavernous structure may originate." These bundles of muscular fibres may be isolated and show irregularities of size along the course of their cells. The nuclei are readily distinguished by coloring, and, although there is quite a variety of form and combination in different specimens or different parts of the same specimen, the general histological picture is always reproduced. * * * * As is shown in the accompanying microscopic illustrations, almost never is it possible to trace a vessel or nerve into the centre of the developing knot of the new growth, and, as has been previously stated, the arrangement is rarely concentric, but the bundles interlace at angles to leave open spaces; and here, in sharp distinction from the bundles of muscular elements, is easily observed the connective tissue stroma. Several authors have described nerve endings in the tissue of the fibro-myoma. In my own studies I have never been at all

certain of their presence. * * * These specimens are from various localities in the uterus, and nearly all show the so-called capsule to consist of concentric layers of muscular fibres, very much altered by tension and compression, loosely held together by very delicate filaments of connective tissue, which allows not only an easy separation of the tumor from the surrounding uterine tissue, but may itself be often subdivided. Proliferation of connective tissue under the irritation of a growing mass is notably the rule in the surroundings of benignant tumors—a method of protection, so to speak, to the neighboring parts. Then as more and more the normal tissues are put upon the stretch, the surrounding vessels are deflected, and it is easy to picture that which is actually observed to ensue—not only an investing capsule but a surrounding network of vessels."

Courty, writing upon the evolution of fibromata (the uterus, ovaries, and Fallopian tubes) says: "Owing to our ignorance as to the commencement of the evil (from knowing only large tumors) it was believed that there was a want of primordial continuity between the myoma and the uterine tissue. (Bayle, Cruveilhier) But after his tological researches had proved the identity of the fibres of the myoma proper with the muscles of the uterus, these tumors, which at first were thought to be developed in an interposed blastema, were then regarded as resulting from local hypertrophy, and at a later period as being all special hypertrophic forms of uterine parenchyma. This connection is so close that sometimes it is impossible to limit even large tumors, especially if they are soft. Fibromata, therefore, seldom appear to be formed by the interstitial development of elements similar to those in the midst of which the fibro-plastic is produced, or their formative blastema deposited, but more frequently by the proliferation of a limited group of uterine fibres, which become isolated from all the others just as adenoid tumors are developed in the glands, heter adenomata in their neighborhood, pigment in the choroid, etc. The life of fibromata may be said to be a parasitic one as soon as they are isolated from the tissue from which they have taken birth. The anatomical independence which they then acquire as regards the uterine fibres, the feeble vascularity which they enjoy, the capillarity of the vessels by

which their periphery communicates with the rest of the womb, all concur to prove their physiological independence. It is easily ascertained that, with the exception of some adhesions abnormally established, they have no continuity with the tissue of the womb, but are separated from it by a loose cellular tissue as if by a cyst wall, sometimes by accidental serous bursae, sometimes even the nutrition of fibromata takes place by imbibition; it is probable that it is so when they seem to be contained in an envelope, or kind of sac, which isolates them in every direction; it cannot be otherwise when they are perfectly free in the abdomen without, on that account, experiencing any alteration, and even without ceasing to grow, which is accounted for by their being protected from contact with the air, and from the obscurity of their life. The growth of fibromata is unlimited; it is very variable according to whether their development is rapid, slow, stationary or even retrograde."

Vascularity.—The point of greatest interest in the pathology of fibromata is that of their vascularity. Ziegler says: "Every tumor is developed from pre-existing tissue cells by proliferation; in some tumors new blood-vessels are also formed. Nuclear sub-division is indirect; new vessels are formed by off-shoots from existing ones." Cruveilhier said: "It is in these bodies that the vascular system of fibrous bodies in general can be best studied. A considerable vascular net-work envelopes them; this is entirely venous; it communicates largely with the veins of the uterus, which have acquired a calibre proportioned to that of the fibrous bodies, and to the development of the uterus. On the other hand, this venous network receives all the veins which arise in the substance of these bodies. No uterine artery has appeared to me to penetrate the fibrous bodies whose circulation is reduced to its most simple expression; no lymphatic vessel has been demonstrated; no uterine nerve has been traced into them. Hence the absolute insensibility of these bodies." Oldham has demonstrated vessels in some tumors—these being more marked in soft, fleshy tumors. Small vessels appear in one of Marcy's preparations. Figure 2, plate 52, of Martin's Atlas of Obstetrics and Gynæcology, also shows the open mouths of some vessels. Barnes (Diseases of Women) refers to injected

specimens in St. George's Museum and St. Bartholomew's, which show the vascular nature of these growths. Klebs (Handbuch der Pathologischen Anatomie) recognizes the existence of a blood supply within the tumor. In their infancy tumors have a rich vascularity—the blood-vessels becoming partially or wholly obliterated by pressure and induration, as the growth takes on new form, and increasing in size and density presses upon surrounding tissues. Fibromata are unquestionably of low vitality, and this accounts for their slow growth, but that they are entirely devoid of vascularity, I am not inclined to believe. There must be something more than imbibition to foster, nourish and perpetuate their life. Imbibition from surrounding vascular structures would be very slight, and, owing to the very nature of the encapsuled tumor, oftentimes impossible. Soft tumors have a rich blood supply. Ordinarily tumors possess an independent life. They have their own blood supply, they live and grow upon the tissues giving birth to them, constituting "an entity within an organism more complete." "It is not known that tumors possess nerves, unless they may be constituted by nervous tissue of new formation neuroma); they want, consequently, those regulators of the nutritive functions which connect the different parts of the same living organism with a common centre. This absence of nerves impressed Schröder van der Kolk and prompted him to make the following experiments. He cut the nerves of a dog's paw, then produced a fracture of it; the callus became exuberant and formed a veritable tumor of granulation tissue. This fact would suggest the importance of a series of researches for the purpose of learning if the exaggerated nutrition of a part of the organism, separated from its regulating centre by interruption of the nerve tubes, could determine the production of a tumor." (Cornil and Ranvier.) Dr. John Williams, who contributes the article upon "Growths in the Uterus," to Reynolds' System of Medicine, says: "They possess a kind of hilus with a large venous plexus, from which veins proceed between the lobes of the tumor along the processes of connective tissue found there, receiving in their course minute venous branches from the growth. Opposite the hilus the wall of the uterus presents a cavernous structure. While the veins are of considerable size, the arteries supplying fibroid

tumors are usually minute. They enter in the band of connective tissue by which the tumor is attached to the uterine wall and ramify in the tumor. Attempts at injecting the arteries of fibroid tumors have in some instances failed. This was probably due either to some peculiarity in the growth itself, as commencing degeneration, causing occlusion of the vessels, to imperfect fluidity of the material injected, or to imperfect manipulation, for usually there is no difficulty in injecting the vessels of growths of this nature, and when injected with a solution of carmine their section presents a deep pink color, though no vessels of any size can be distinguished in them. Though the hard fibroid tumors are usually but little vascular, it is important to bear in mind that this is subject to exception, and that occasionally an artery as large as the radial supplies the growth." It is a well-known fact that fibrous tumors enlarge coincidently with the enlargement of the uterus at menstruation, and this can only be explained upon the hypothesis that more blood is sent from the engorged uterine vessels through the vessels ramifying in the tumor. Fibrous tumors are liable to become filled with blood from a telangiectatic dilation of the vessels within the tumor.

It is impossible to say absolutely that any uterine tumor of appreciable size, started as fibrous or as muscular. Not every growth which presents a spindle-shaped cell is a myoma, and for this reason it seems best to modify Virchow's assertion that a numerous class of uterine fibromata are not really fibrous, but in truth muscular growths or *myomata*. Nearly all of the solid uterine tumors that have received microscopical examination have shown a structure precisely similar to that of fibromata. If they started as muscular the typical spindle-formed cells with rod-shaped nuclei have been lost, owing perhaps to the tissue packing of increased growth. Probably the earliest *representation* of the growth of a fibroma would be shown by a mass of germinal matter, which, later on, forms itself into spindle cells and at the stage of complete development, into tissue not to be distinguished from tendon, except in the irregular arrangement of the fibres. Whence comes the cell which gives the tumor its origin, and where had it existed? Virchow claims that the cells at the point of departure of the tumor, multiplied by division, and that the new growth represented or took the place of a certain amount of normal tissue. Cohnheim showed that the white blood corpuscles furnished the elements by cell division.

Stricker suggested that it is due sometimes to emigration, in others to autochthonous cell division (Virchow); while in others, both may be concerned in the formation of neoplasm.

Whatever may be the origin of the cell from which the tumor springs, the question arises: Does the cell contain within itself the potentiality of tumor growth, or is it operated upon by exciting causes extraneous to itself? Autochthonous cell division is not a pathological process as opposed to the physiological process of cell growth. Generally the walls of the uterus are in a pathological condition favorable to the tumor cell growth. In their infancy these cells increase, multiply and become appreciable swellings by reason of a rich blood supply, and this vascularity, though in case of the hard tumors, in diminished degree, is maintained throughout their existence.

The point from which *fibro-myomata* have their origin is of the greatest clinical importance. Located in the uterine wall nearer to the peritoneum, it will develop in the direction of the least resistance, under the peritoneum, towards the abdominal cavity, and thus is formed the so-called *sub-serous* variety. When it begins in the deeper layers, and in its development presses the unchanged uterine tissues in either direction, it produces the variety called *interstitial*; while situated nearer to the mucous membrane its growth will be towards the uterine cavity, which in these cases is materially hastened by the contraction of the healthy surrounding muscular wall, and thus is formed the *sub-mucous*. Longer continued uterine contractions toward expulsion, and the attached fibroid increases in length and lessens in diameter. Thus is produced the *polypoid fibroid*" (Dr. Marcy, op. cit.).

Any part of the uterus may be the original seat of the affection, but the body and fundus are their usual starting points. Rarely are they met with in the cervix, still more rarely in the vagina. Dr. Williams (op. cit.) says: "Fibroid tumors are the most common form of uterine neoplasm. According to Bayle, they are found in 20 per cent. of women who die after the age of thirty-five, while Kolb says they occur in forty per cent. of women who die after the fiftieth year. Dr. Charles West found fibrous tumors in the uteri of seven women out of seventy who died after the age of puberty, examined by him at St. Bartholomew's Hospital. Mr. Pollack states that of 580 who were examined by him at St. George's Hospital nine only contained fibroid growths. Braun and Chiari assert that out of 2,494 post-mortem examinations made in both sexes, in twenty-

five instances were fibroid tumors found."

Bayle's statement is probably exaggerated. Dr. Hewitt (*Diseases of Women*) out of ninety-six cases found tumors in eight cases before the age of twenty-six. Scanzoni considers these tumors most common between the ages of thirty-five and forty-five, while out of eighty-seven cases tabulated by Dr. West, twenty-one cases occurred between the ages of twenty and thirty.

Dr. Emmet in table 40 (*Principles and Practice of Gynæcology*) tabulates 225 cases. The earliest age was eighteen, an unmarried woman; the next a sterile woman at the age of twenty-two; one at twenty-three; ten between the ages of twenty-four and twenty-five; and one at the age of fifty-eight. He goes on to say that the age of greatest liability, for all women, is shown to be between thirty and thirty-five years. But if the consideration is limited to those only who had fibroids and fibrous tumors we find 35.26 years as the average age for the first, and 38.04 years for the latter. Dr. Oerum (*Goodell, Lessons in Gynecology*) found in the record of 1,002 autopsies of female bodies of all ages performed in the city hospital of Copenhagen fifty-three cases with uterine fibroids, or 5.3 per cent. Under twenty years of age three were 294 cases, and not one had a fibroid. From the ages of twenty to twenty-nine years there were 149 cases, and of these but one had a fibroid. Of 147 cases between the ages of thirty and thirty-nine there were six with fibroids. Of 131 cases between forty and forty-nine thirteen had fibroids. Of 101 cases between fifty and fifty-nine fourteen had fibroids. Of 96 cases between sixty and sixty-nine ten had fibroids. Of fifty-one cases between seventy and seventy-nine eight had fibroids. Of eight cases between the ages of eighty and eighty-nine one had a fibroid. Of twenty-five whose ages were unknown, there were nine with fibroid tumors.

Causation.—In 1814 Sir Charles Clarke wrote: "Nothing is known respecting the cause of this disease," and the prime cause of these growths is still unknown. Sterility and single life are both said to be predisposing causes, since uterine congestion and tumor formation seem to go hand in hand. Dr. Goodell (*op. cit.*) gives tables from Dupuytren, Malgaigne, West and McClintock, the totals being: fruitful, 100;

sterile, 39; single, 19; total, 158; and then he comments upon the results as follows: "While willing to concede that 19 old maids to every 158 women who have reached the prime of life is a larger proportion than that deducible from our own vital statistics, I am not so sure that it is much above European averages. Again, to my thinking, this table leaves open the question whether these tumors are the cause or the effect of sterility. For, mind, the heading "Fruitful" does not indicate the condition of fecundity, but simply one in contrast with that of absolute sterility; thus, out of West's 36 cases under this heading, only 16 had more than one pregnancy. It follows, then, that it is just as easy to attribute sterility as infecundity to the presence of these tumors; and as a corollary to this, that sterility is more likely to be their effect than their cause."

Courty says that there is no doubt that the presence of myomata diminishes the number of conceptions and increases that of abortions and miscarriages. Out of 605 patients (of whom 500 were married and sterile, or had become sterile) seen by Marion Sims, 119 had fibrous tumors (not including cases of polypi). Tarnier (*Société de Chirurgie*, Feb. 10, 1869, Courty) out of 42 cases had spontaneous delivery in 8 cases only; in 6 cases forceps were required; in 1 case induction of premature labor was demanded; version 6 times; embryotomy once; enucleation of the tumor once; Cæsarean section 14 times; the malady caused death 5 times before delivery (of these 42 patients only 13 were cured) Ashwell, West, Virchow, Courty and most pathologists, agree that pregnancy is one of the conditions which most promote the formation of these tumors. Emmet's tables show that of all women with fibroids 13.37 per cent. were unmarried, and 50.30 per cent. were fruitful. He says that the development of these growths is retarded by childbearing, and even by marriage, for the sterile woman is less liable than the old maid, but in turn she is more so than the woman who has borne children. He also shows that the average age at marriage for the sterile and fruitful who suffered from fibrous growths, was much later than the general average. From a series of very elaborate and careful statistics, which one must study to appreciate fully, Dr. Emmet infers that "an unusual number of

impregnations within a limited time is as conducive to fibrous growths as is the condition of idleness or absolute rest of the uterus."

Goodell sees in the proliferation of connective tissue-cells, determined by the congestions and extravasations of dysmenorrhœa, a possible cause. "This opinion," he writes, "is strengthened by the striking fact that dysmenorrhœa is the frequent antecedent of chronic metritis, a disease in which the structure of the thickened wall resembles so much that of a fibroid nodule that it is hardly possible to tell them apart. Further corroboration of the congestion theory is gained by the circumstances that fibroids rarely appear before the age of 30, and never before puberty; that the period of their greatest activity corresponds to the period of greatest menstrual activity; that after the menopause they usually cease to grow, and sometimes shrink away; and finally that during the catamenial flux they temporarily so increase in size as often to cause dysuria, and other pelvic disturbances. Other causes of these tumors undoubtedly exist. After the stretching and weakening of uterine fibres by repeated pregnancies, these fibroids have been observed to start at points where the involution has been imperfect." After all, the most that can be said is that the period of growth of these tumors is usually coincident with the period of uterine activity. Just what influence the ovaries exert in these uterine and myomatous changes is not known. Tait's evidence of the independence of the uterine periodical changes and ovarian influence has rendered untenable, or at least not logically conclusive, many opinions of only a few years ago. Yet it is a fact that the ovaries do, in some way, influence the growth of these tumors. Removal of the ovaries has been followed by immediate relief of the alarming hemorrhage. Dr. Hewitt believes that the formation of fibroid tumors in the uterus is connected with defective nutritional vigor of the uterus as a whole.

Dr. Byford (Med. and Surg. Diseases of Women) thinks that the hypertrophy of the vortices or foci of muscular gyrations in the undeveloped condition of the fibrous structure leads to the formation of these tumors, and that this is engendered by hyperæmia.

Ziegler (Text-Book Pathological Anat-

omy) says: "Cohnheim has very recently propounded an *embryonic hypothesis* of another kind. We are not to refer the actual development of the tumor itself to the embryonic period, but are to attribute its appearance in later life to the persistence of germinal embryonic tissues in the otherwise mature organisms (Cohnheim, 'Allg. Path.,' I)." A tumor takes its rise in what we might call a belated rudiment—a focus of formative embryonic tissue, which has not been utilized in elaborating the normal tissue of the part—and so has lingered on unchanged. Cohnheim, therefore, defines a tumor as an atypical new formation starting in a latent embryonic rudiment. The tumor germs, consisting as they do of embryonic cells, may be very small and so elude observation. It is even conceivable, he thinks, that the germinal cells may be quite unrecognizable among the ordinary physiological elements of the part. They may linger on for a long time inactive. It is only when they are favored by the external conditions—such as the supply of nutriment, and their relation to surrounding tissue—that they begin to multiply and to form a tumor. * * In most cases, however, the awakening impulse is beyond our power to discover."

The following will be found of interest as discussing the etiology of tumors and are referred to by Ziegler, or rather by Donald MacAllister, his translator: Virchow, "Die Krankhaften Geschwülste;" Krönlein, "Lang. Arch. f. Klin. Chir.," xxi; Kocher, Art. "Krankheiten des Hodens;" "Handb. d. Spec. Chir. v. Pitha u. Billroth;" Bögehold, "Virch. Arch.," vol. xxxviii; Boll, "Das Princip. des Wachstums," Berlin, 1876; S. Wolff, "Zur Entstehung von Geschwülsten nach traum. Einwirk.," in Diss., Berlin, 1874; Von Winiwarter, "Beiträge z. Statistik. d. Carcinome," Stuttgart, 1878. See also Bristowe, "Trans. Path. Soc.," 1853; Oldham, "Guy's Hosp. Rep." (second series) vols. ii and viii; Williams, Lancet, i, 1880. But Cohnheim himself, acknowledges that, histologically, we know nothing of the persistence of true embryonic tissue. "Haase has attempted to give Cohnheim's hypothesis a morphological basis ("Die Beziehungen der Morphologie zur Heilkunde"). The morphologist distinguishes two kinds of substances within the organism: one kind undergoes a series of transformations, the other provides

for the formation of new tissues. The latter he describes as "embryonic substance." It is represented by cells which have undergone little or no transformation, and are more apt to multiply the less their original character and structure have been modified; the nearer they stand to the formative cells of the embryo. From these cells only can new tissue be formed. Tumors are especially likely to be developed at spots where these "embryonic cells" are abundant and unmodified" (MacAllister, op. cit.). Ziegler (op. cit.) does not think the hypothesis tenable which refers all tumors whatsoever to pre-existing embryonic germs. He believes that the entire behavior, anatomical and biological, of tumors justifies us in regarding them as formations more or less emancipated from the matrix tissue, and that the efficient cause of the formation of a tumor does not depend upon one law, but upon several.

Diagnosis.—Mr. John Clay has furnished an aggregate list of thirteen cases of attempted ovariectomy where extra-cranial tumors were removed. Of these, eleven cases were uterine growths. Mr. Clay has also given an additional list of twenty-three cases where ovariectomy was attempted, and abandoned in consequence of the disease being extra-ovarian. Of these last, twelve were examples of uterine disease. But such errors are being made in our own time, for in some cases an accurate diagnosis is almost impossible. A differential diagnosis of fibro-miomata will involve the consideration of the following points:

1. The mode and position for examination, and the previous history of the patient.
2. The particular notation of special symptoms, and the testing of their relative value.
3. Particular reference to the differential diagnosis between pregnancy and ovarian disease.

This is the division given by Routh, and it seems to me that it covers the whole ground in a very thorough and concise manner.

Elaborated as he has done it, in his most admirable monograph on fibrous tumors there is little left to be said, and I shall draw freely from his ripe experience.

1. *The position in which the patient is placed for examination.* The position on either side, on the back, on all fours with the *nates* raised, or that usually adopted in

ballotement, may each be necessary in individual cases. The last position Routh believes to be extremely useful, because many patients with myo-fibroma are extremely corpulent, so that external palpation affords but little help. With the patient standing in a chair and leaning over you, the finger in the vagina can make out the affected organ, which falls by its own weight, and presses upon it. Now if pressure be exerted from above on the abdominal parietes, the point from which it is felt in the vagina indicates the height to which the tumor extends within the abdomen and also the connection with the uterus by contiguity of structure. A sound may often be passed in one position and not in another. The changed position allows the weight of the diseased organ to bear in a different position, so that adhesions can be made out. The test usually given for adhesions, of a full inspiration, is not sufficient. It is said that if the abdominal parietes move freely over the tumor adhesions do not exist. If the patient be corpulent this movement may be that of the skin over the muscles, or it may not be perceptible at all, and if the tumor be low down in the pelvis it may be difficult to raise it, so that adhesions may be inferred to exist, when in reality they do not exist at all. The adhesions may be present superiorly, higher up in the abdomen. Had the patient been placed on all fours the tumor would probably have moved a little from the pelvis, and the non-existence of adhesions would then have been made out. By the use of the finger and sound, or of two sounds in two of the pelvic passages at the same time (bladder, uterine cavity and rectum) the situation of a fibroid can be very generally made out. External abdominal manipulation is valuable but insufficient. If the tumor be in the posterior wall, one finger in the rectum or vagina and a sound within the cavity will clear up the case. If it be in the anterior wall, the tumor will be determined by the space between the two sounds, one of which is in the bladder and the other in the uterine cavity. In this way a small fibrous tumor will not be mistaken for retro or ante-version. When the tumor is high up above the true pelvis, it is almost impossible to say whether it is in the anterior or posterior wall. In tumors of the lateral wall, especially if on the left side (owing to the sigmoid flexure of the colon), the ordinary

digital examination *per vaginam* may be assisted by two sounds. In all such cases the bladder should be emptied beforehand. For the exact measurement of distances Routh constructed a pelvimeter.

2. *Previous History*.—A most searching cross-examination should be made into the previous history of the case. A woman may imagine herself pregnant, and stubbornly assert that she has felt the foetal movement, and that she has exactly the same feeling that she has when carrying other children. A cellulitis or a hæmatocele may be supposed to exist, from an ordinary examination. Now, if a large tumor be impacted within the pelvis, the uterus is fixed. The finger comes against a large swelling, but fails to make out fluctuation. Fibrous tumors are not usually fixed, and a cellulitis generally extends more on one side than on another. But a fibrous tumor may lead to a conjoined fixation of the uterus, so that the closest analysis of previous history will alone clear away the doubt. Routh was in the habit of using a *kinometer* to measure the amount of uterine movement, which enabled him to distinguish with some ease between cellular abscess and hæmatocele and a fibrous tumor.

2. *Symptoms*.—Hardness, roundness and solidity of the tumor, an enlarged abdomen, umbilicus sunken, lumbar regions clear on percussion, more or less intense menorrhagia. Tumor felt *per vaginam*, involving the uterus, absence of fluctuation, uterine cavity lengthened, impossible to press the hand low down between the tumor and the walls of the abdomen. The feel of a fibrous tumor is regarded by some as pathognomonic; but a cellulitis, a hæmatocele, or an ovarian dropsy may convey the same sensation. The *auscultatory signs of a uterine fibrous tumor* are dwelt upon at length by Routh, and discussed by Savage, McClintock, Hunter, Goodsir, Herard and others. These sounds are four in number: *a.*—Two souffles, one a tubular, another a vesicular murmur; *b.*—a thrill; *c.*—a single or double cardiac sound; *d.*—absence of multilocular arrangement indicated on percussion. A *vaginoscope* has been used to make out the tubular souffle within the vagina. *Menorrhagia*. From an analysis of 350 cases, in which full histories were given, I found that menorrhagia obtained in 72 per cent. It occurred most

frequently in the intra-uterine variety—3 per cent., or 105 cases. The intramural and sub-mucous tumors were attended with menorrhagia in about equal degree, nearly $2\frac{3}{4}$ per cent. Cruveilhier stated that sub-peritoneal tumors did not give rise to hemorrhage, that those projecting into the cavity did, and that all efforts at expulsion aggravated the result. In the 25 cases occurring in the practice of Dr. McClintock 14 had menorrhagia, and in 11 it was absent. In 5 of these last the tumors were distinctly subperitoneal or interstitial. Routh analyzed 61 cases. In 13 cases the existence of menorrhagia was not stated. In the 34 cases in which hemorrhage was noted the tumors were: interstitial, 1, intramural, 5; sub-mucous, 4; intrauterine, 10; in the anterior wall, 5 (one projecting into the uterine cavity); in the posterior wall, 1 (projecting into the uterine cavity); extrauterine 1.

The 14 cases without menorrhagia were, interstitial, 1; intramural, 1 (this patient had never menstruated and the Fallopian tubes were found closed after death); in the anterior wall, 4 (one had closed os, another had ceased to menstruate for two years previously); in the posterior wall, 2 (one had a tumor projecting into the uterine cavity, but the internal os was closed); extra-uterine, 5; several all over, but pregnant, 1. This hemorrhage is both menorrhagic and metrorrhagic. These losses of blood in the intercalary period are often the first symptoms of fibromata. It occurs in women who have ceased to menstruate, and seems to relieve the lumbar pains from which they suffer. This hemorrhage increases if the fibrous body becomes pediculated, and is a very prominent symptom of polypi. It is probably due to an increased fluxion of blood demanded by the growth, and to the changes in the uterine mucous membrane occasioned by the same exciting cause. This seems to be a curt summing up of the discussion which has been going on in regard to the source of the hemorrhage, but one cannot follow out his inclinations in an article of this nature, otherwise it would have been my pleasure to go more elaborately into questions of Histology and Pathology, and to point out more completely the distinctive signs of sub-peritoneal, sub-mucous, and subserous tumors.

The differential Diagnosis in regard to Pregnancy.—The principal points to be ob-

served are: 1. The breasts. 2. Ballotement. 3. The cardiac sounds (in fibrous tumors). 4. The umbilicus. 5. The catamenia. 6. The nature of the pain. 7. Examination.

1. *The breasts.* Cases have been reported in which a patient carrying a fibroma, has noticed a hypertrophy of the breast from adipose deposit, and from enlargement of the lacteal vessels. A fluid with all the properties of *colostrum* has been squeezed from the nipples; the areola was marked and oedematous and the follicles enlarged. This difference, however, is to be noted. In fibromata the breasts are unsymmetrical, the follicles are of the same color as the areola. These vesicular or papuloid follicles are never found in fibroma, but are common in pregnancy. The follicles of the same color as the areola are most numerous near the nipple. The reverse is the case in pregnancy.

2. *Ballotement.* A *pseudo-ballotement* can sometimes be made out in fibromata. Ballotement should be tried after the fourth month, and after the fifth month voluntary movements and foetal heart sounds will assist the diagnosis.

3. *The double cardiac or single cardiac murmur.* Routh says that these sounds are so seldom absent in large fibrous tumors that their absence alone ought to make us doubt.

4. *The umbilicus* projects in pregnancy; is puckered in fibromata.

5. *Catamenia.* While in uterine tumors there is a tendency to hemorrhage this does not always supervene. So long as the decidua last there may be a stoppage, but when these are thrown off, and uterine excitement comes on, there will be a greater or less loss of blood. Of one hundred and fifty cases analyzed by me, I find that in 20 cases menstruation was entirely suppressed. In 70 cases it was irregular, being suppressed for a period varying from one month to four, and then coming on very profusely, alarming the patient. In 3 cases there was uterine loss regularly, but slight in amount. In 7 cases menstruation came on normally after suppression. In this connection Emmet's tables may be read with advantage. In a certain number of cases change of life takes place, and the tumor may decrease in size, or give no further trouble other than that incident to its weight. As the starting point of these tumors, in the greater propor-

tion of cases, is from the inner side of the uterine canal, there is always a tendency to hemorrhage during their growth.

6. *The nature of the pain.* If expulsive pains be present an abortion would necessarily result if the womb contained a foetus. In an abortion we have, coincidentally, pain and hemorrhage, the pains ceasing with the hemorrhage.

7. *Examination* This is physical and oral—i. e. the history of the case. Rectal and vesical tenesmus usually accompany fibroids; constipation and strange displacements are frequent. Palpation in multiple tumors projecting toward the peritoneum, will give a nodulated feel. But it is to the finger and sound, together with abdominal palpation that we shall address ourselves with confidence. The thickness of the uterine walls, displacement of any of the pelvic organs, the enlargement of the uterine canal, the condition of the bladder, can all be satisfactorily diagnosed. The speculum is of little or no use.

Uterine Fibroid.

Not usual.

Spurious fluctuation due to flabbiness, vascularity, cedema, or to pseudo-cysts.

Usually a history of menorrhagia.

Slow growth.

Partial enlargement, peculiar feel.

Enlargement of superficial veins.

Measurement symmetrical.

Increase of space from pubes to umbilicus.

Tumor usually fixed to lower abdomen.

Health fine, countenance natural.

Per Vaginam.

Tumor inseparable from uterus, with which it moves. Cervix often obliterated, changes in uterine cavity and canal. Sub-peritoneal pediculated tumors move independently of uterus.

Ovarian Cyst.

Grows from one side.

Fluctuation distinct.

Catamenia often scanty.

More rapid growth.

Enlargement more general, smoother feel.

Less common, except when cysts are large. Circular measurement greater on one side than on the other.

Not marked.

Can be raised from pelvis.

Emaciation, parched anxious countenance.

May be separated from uterus and does not move with it. Uterus normal.

Excluding extra-uterine fibroids, the state of menorrhagia is normally that of myofibromata, quite exceptionally that in ovarian disease.

Prolapse of the Uterus usually inverts the vaginal walls, which does not happen when a pediculated fibroid passes through the cervix. If the fibroid has a cavity and a transverse fissure simulating the cervix, the uterus must be made out by means of the cervix, the vaginal *cul de sac*, the bladder, ureter, etc.

Inversion of the Uterus. In inversion above the ring which encircles the tumor, a furrow exists all around, a *cul de sac* which cannot be prolonged into a uterine cavity. The characteristic displacement may be made out by a sound in the rectum, or by means of a male catheter in the bladder. Acupuncture may be utilized.

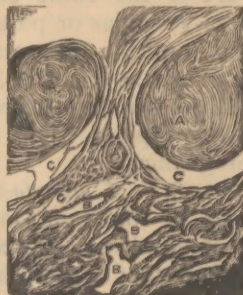
Displacement of the uterus, pelvic abscess, and haematocoele have already been alluded to.

Fibro-cystic Tumor. Koeberlé establishes the following signs; 1. The *facies uterina*. 2. Tumor variable in consistency. 3. The results of tapping. 4. Nodular feel after tapping. 5. The uterine connections. An examination *per rectum* with the patient anæsthetised will make out the uterus displaced towards the abdomen; with an ovarian tumor it is displaced toward the front or back. The uterine cavity is increased in length generally, and movement is communicated directly to the sound. Generally it may be said that fibro-cysts are rare, occurring before thirty, that there is no emaciation, that they are of slow growth, there is menorrhagia frequently, that the solid portion is in excess of the cystic.

What concerns us chiefly in the study of these growths is their relation to Myomotomy and to Gastro-Hysterectomy. Both of these operations with exhaustive statistical tables I have reviewed in the Nov. and Dec. numbers et seq. of the *Amer. Journal of Obstetrics*. The popularity that is the natural outcome of success has placed abdominal surgery beyond that pale of conservatism which formerly relegated it to the impossible. The very fortunate coincidence of this evening will give one microscopist an opportunity to verify some of the points of this paper, and I shall await with interest his report upon Dr. Johnson's case. The etiology of myomata is still enshrouded in uncertainty, and the temptation to de-

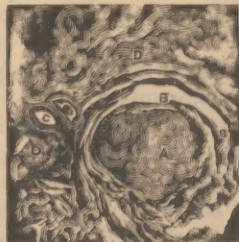
part from strict scientific, definite inquiry into the realms of metaphysical reasoning is very great, but since the Finite may never reach the Infinite, we are arrested upon the very threshold of knowledge and must await a season of demonstrable proof. The diagnosis is a matter of moment and of difficulty, and I would commend Routh's monograph, which I consider a very remarkable publication and too little known. Long names and technical discussion are not always interesting, but since one nomenclature tends to the former, and since the importance of the latter may not be gained, I may be pardoned for prolixity.

Fig. 1.



From a preparation by H. O. Marcy, M. D., Boston.
a, a, a.—Three independent tumors.
b, b, b.—Series of extraordinarily enlarged peripheral vessels.
c, c, c.—Connective tissue.

Fig. 2.



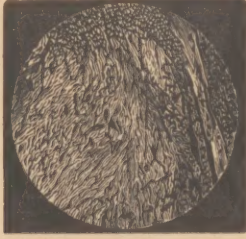
From a preparation by H. O. Marcy, M. D., Boston.
a.—Multilobular firm tumor.
b, b.—Very delicate bands of connective tissue.
c, c.—Vessels.
d, d.—Surrounding uterine tissue, its bundles more than usually distinct.

Fig. 3.



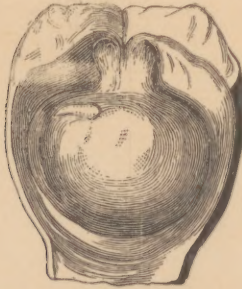
From a preparation by H. O. Marcy, M. D., Boston.
The open spaces and dark lines represent the vessels (2 inch Towle's objective). The border of the new growth and capsule is readily seen.

Fig. 4.



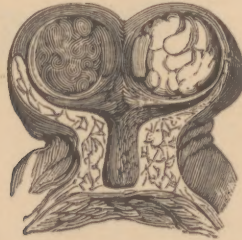
From a preparation by Henry O. Marcy, M. D., Boston.
(Towle's 1 inch objective).

Plate M.



(From Billroth's Handbuch der Frauenkrankheiten vol.
iv; article by Gusserow). Large sub-mucous uterine
fibroma.

Plate N.



(From Billroth's Handbuch, vol. iv). Intraparietal
Myoma.

P



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